



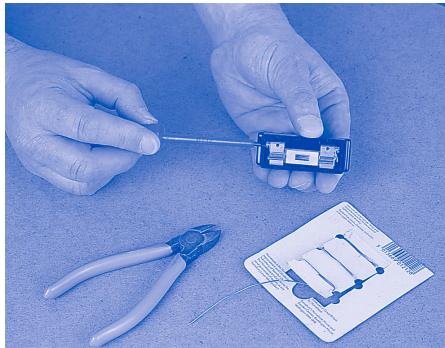
Wickes

BUILD YOUR SKILLS

ELECTRICITY BASICS

Electricity is a service that's very much taken for granted in the home, and many householders prefer to leave it that way. However, there are times when faults occur that can interrupt the supply, and it helps to know how the system works so you can put things right without having to call for expensive professional help.

- The heart of your system is your fuse box. This contains fuses that prevent individual lighting and power circuits in the house from being dangerously overloaded with too many lamps or appliances.
- A modern system will have a consumer unit containing switches called miniature circuit breakers, rather than fuseholders containing wire or cartridge fuses. The unit may also contain an extra safety device called a residual current device.
- You may need to carry out some simple electrical repairs, such as replacing damaged plugs or worn flex on lights and appliances. This leaflet shows you how.



Rewirable Fuses

- Each circuit in the home is designed to supply a safe maximum amount of current. If you overload a circuit by trying to draw too much, the circuit fuse will melt and cut off the current to prevent the cables from overheating.
- Turn off the power supply at the main on-off switch in (or next to) the fuse box. Then pull out individual fuseholders one by one until you find the fuse that has melted.
- Remove the old wire and fit a new length between the fuseholder terminals. Use 5-amp fuse wire for lighting circuit fuses, 30-amp wire for fuses on circuits to socket outlets, and 15-amp wire for the immersion heater fuseholder. [PIC 1]

Cartridge fuses

- Some fuse boxes contain cartridge fuses instead of rewirable ones. Apart from 15 and 20-amp fuses, each is a different size and is colour-coded - white (5-amp), blue (15-amp), yellow (20-amp), red (30-amp) and green (45-amp).
- When a fuse blows, pull out fuseholders to find the affected fuse. You may need to use a continuity tester to check the fuses if there is no visible sign of charring on the cartridge case.
- Remove the blown fuse and fit a replacement of the same current rating. Then replace the fuseholder and restore the power supply. Make sure you have a supply of spare fuses of each current rating.

Miniature circuit breakers

- Modern wiring installations use miniature circuit breakers (MCBs) instead of fuses. These are more sensitive to overloading, so offer a higher level of protection. A residual current device (RCD) is an additional safety device that cuts off the supply instantly if it detects current leaking to earth - when someone receives a shock, for example.
- If a fault occurs that trips an MCB to off, switch the affected MCB back on. You will not be able to do this if the fault is still present, so unplug or isolate the appliance that appeared to have caused the fault or overload.
- Similarly, switch a tripped-off RCD back on to restore the supply. Again it will not switch on if the fault is still present.

ELECTRICAL REPAIRS

Fitting a new plug

Although all new electrical appliances are now sold with a plug fitted, you may still have to replace plugs that get damaged. And you'll have to connect up a plug if you need to replace a worn or damaged appliance flex. Here's how to do it.

First remove the cover from the old plug by undoing the central screw. Then free the flex from the cord grip and disconnect its cores from the plug terminals. You may have to remove the fuse from the live pin first to reach the live terminal screw.

If the plug is a sealed factory-wired one, cut through the flex close to the plug.

Deform the pins with a couple of sharp hammer blows so it can't ever be plugged into a socket outlet, and discard it.

Reconnect the flex cores to the terminals of the new plug. With the open plug interior facing you, link the Brown live core to the Bottom Right terminal, the Blue neutral core to the Bottom Left terminal, and the green-and-yellow earth core (if the flex has one) to the top terminal.

With screw-on stud terminals, remove the nut and wind the core clockwise round the threaded stud. Then tighten the nut to trap the core securely. With pillar terminals, loosen the terminal screw and push the core into the hole. Tighten the screw down to secure it.

Replace the plug fuse, after checking that it is the right rating for the appliance. Use a 3-amp fuse (colour-coded red) for appliances rated at up to 700 watts, and a 13-amp one (colour-coded brown) for all more powerful appliances.

Then secure the flex sheath in the cord grip - either by trapping it under a screw-down bar or by pressing it into two nylon jaws - and replace the plug cover.

Preparing flex

If you need to replace an appliance flex, or if you have removed a damaged sealed plug, you have to prepare the flex so it can be connected. In the case of a new appliance flex, you also need to check that you have the right screwdrivers to open the appliance casing. Many are now secured with hex or Torx screws, which need special drivers.

PROBLEM SOLVER

[P] The lighting circuit fuse has blown.

[S] With the power off, unscrew the covers of pendant lampholders and ceiling roses to check for loose connections or broken cores. Remake or repair any that you find, replace the fuse and restore the power.

[P] An electrical appliance has stopped working.

[S] Unplug it and open the plug so you can check for loose connections. Remake any you find. Then test whether the fuse has blown using a continuity tester, and fit a replacement if necessary. If the appliance still won't work, have it repaired professionally.

[P] A whole circuit is dead.

[S] Switch off all light or unplug all appliances. Then check the fuse box or consumer unit for blown fuses or tripped-off MCBs. Restore the power (see overleaf), then

You must buy flex of the right rating for the appliance. You need 0.5mm² flex for lamps, 0.75mm² flex for appliances rated at up to 1.3kW, 1mm² flex for appliances rated at up to 2.3kW and 1.5mm² flex for more powerful appliances. You'll generally need three-core flex, except for table lamps and double-insulated appliances such as hair driers and power tools, which use two-core flex.

Start by holding the flex with the last 50mm bent back on itself. Nick the sheath on top of the bend with a sharp knife, and it will split open. Reverse the bend and repeat the operation. This technique avoids any risk of cutting into the insulation on the flex cores. Pull off the section of sheath.

Lay the flex end over the plug, lead each core to its correct terminal and cut it to length with side cutters. Then use wire strippers to remove about 10mm of insulation from each core, taking care not to cut through the fine wires inside. Twist the bare wires neatly together ready for connection to the plug terminals (see above).

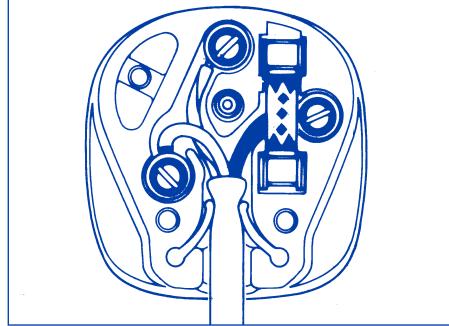
Next open the appliance casing so you can gain access to the terminal block. Note how the old flex is routed, then disconnect the cores and withdraw it. Feed the new flex in, via any rubber sleeves or washers, and connect its cores to their terminals.

Replace the casing, plug the appliance in and check that it's working.

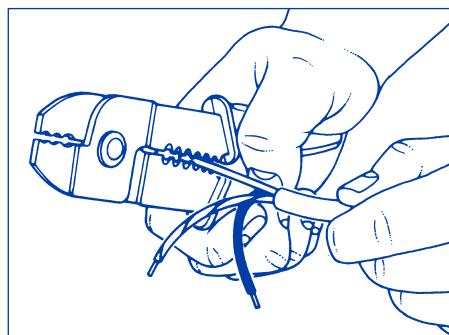
Extending flex safely

If you have an appliance that needs a longer flex, you have two choices. You can either remove the existing flex and fit a longer length of new flex, connecting it as described above. Alternatively, you can use a flex connector. Choose a one-part connector for a permanent extension, and a two-part one if you want to disconnect and store the flex extension separately.

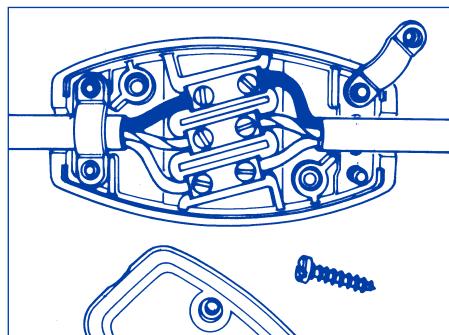
Prepare the flex ends, then open the connector and link the cores to the terminals. In a one-part connector, each pair of like cores is connected to a small brass barrel connector. In two-part connectors each core goes to its own terminal. With this type, be sure to fit the part with the pins to the flex leading to the appliance, and the part with the sockets to the flex leading to the plug.



This is how the interior of a correctly wired plug should look, with the flex secure in the cord grip.



Prepare flex for connection to plugs or appliances by removing some of the sheath and core insulation.



This is how the interior of a correctly-wired one-piece flex extender should look.

switch on lights or plug in appliances to see whether any were responsible for the fault and will again blow a fuse or trip off an MCB. Stop using faulty equipment and have it repaired professionally.

[P] The whole system is dead.

[S] If your system is protected by an RCD, check to see whether it has tripped to off. Reset it if possible; if you cannot, the fault that tripped it is still present on the system. If you don't have an RCD, and there is no local power cut, call your electricity company's emergency number and ask for an engineer to call and put the fault right.